vitrification of cell or tissue specimens by dehydrating in solutions comprising a permeating cryoprotectant, a non-permeating co-solute and a non-permeating polymeric cryoprotectant followed by cooling to refrigeration or higher storage temperatures.--

Please insert the following sentence as the first sentence on page 1: --This is a 35 U.S.C. §371 application of PCT/US97/15611, filed on September 5, 1997, which claims priority to U.S. Provisional application No. 60/025,570 filed on September 6, 1996.--

In the Claims

Please amend Claims 1, 4-7, 9, 10 and 12-16 as follows:

1. (Amended) A method for preserving a cell or tissue specimen comprising **[the steps of contacting]**:

equilibrating and thereby dehydrating the specimen [with] in a vitrification solution comprising a permeating cryoprotectant, a non-permeating co-solute and a non-permeating polymeric cryoprotectant, wherein the non-permeating co-solute effectively decreases the chemical potential of the **[characterized by its ability to limit the amount of a]** permeating cryoprotectant thereby limiting the amount of the permeating cryoprotectant which **[to permeate]** permeates into the specimen; and

vitrifying the dehydrated specimen, without freezing, by cooling to a refrigeration or higher storage temperature.

4. (Amended) The method **[for preserving a cell or tissue specimen as claimed in]** of claim [2] 1, wherein the permeating cryoprotectant is selected from the group consisting of dimethylsulfoxide, ethylene glycol, propylene glycol and glycerol.

5. (Amended) The method **[for preserving a cell or tissue specimen as claimed in]** of claim [2] 1, wherein the non-permeating polymeric cryoprotectant is selected from the group consisting of dextrans, starches, polyethylene glycol, polyvinylpyrrolidone, **[Ficol]** FICOLL and peptides.

6. (Amended) The method **[for preserving a cell or tissue specimen as claimed in]** of claim 1, wherein the non-permeating co-solute is selected from the group consisting of an amino acid, [and] an amino acid derivative **[derivatives thereof]**, a betaine, a carbohydrate and a sugar alcohol**[, wherein the carbohydrate is selected from the group consisting of an aldose**

monosaccharide, a ketose monosaccharide, an amino sugar, an alditol, an inositol, aidonic, uronic and aldaric acids, disaccharides and polysaccharides].

7. (Amended) The method **[for preserving a cell or tissue specimen as claimed in]** of claim 1, wherein the total concentration of non-permeating co-solute **[in the co-solute solution]** is between about 0.1 and 0.7 mol/l **[and is equal to a maximum possible concentration that does not substantially damage cells]**.

9. (Amended) The method **[for preserving a cell or tissue specimen as claimed in]** of claim [2] 1, wherein **[the method]** equilibrating and thereby dehydrating the specimen is performed in two or more stages of contacting the **[sample]** specimen with increasingly higher concentrations of the permeating cryoprotectant and the co-solute.

10. (Amended) The method **[for preserving a cell or tissue specimen as claimed in]** of claim [2] 1, wherein **[the method]** equilibrating and thereby dehydrating the specimen is performed by simultaneously increasing concentrations of both permeating cryoprotectant and the co-solute from an initial concentration to a final concentration according to a desired profile.

12. (Amended) The method **[for preserving a cell or tissue specimen as claimed in]** of claim [11] 1, further comprising **[the step of]** rehydrating the specimen by contacting the **[preserved]** vitrified specimen with a rehydration solution comprising a non-permeating rehydration co-solute **[characterized by its ability to limit the amount of a]** which effectively decreases the chemical potential of the permeating cryoprotectant **[to permeate into the specimen, such that cryoprotectant within the specimen is removed from the cells of the specimen]**.

13. (Amended) The method **[for preserving a cell or tissue specimen as claimed in]** of claim 12, wherein the permeating rehydration cryoprotectant is selected from the group consisting of dimethylsulfoxide, ethylene glycol, propylene glycol and glycerol.

14. (Amended) The method **[for preserving a cell or tissue specimen as claimed in]** of claim [12] 13, wherein **[the rehydration step]** rehydrating the specimen is performed by simultaneously decreasing concentrations of both the permeating rehydration cryoprotectant and the non-permeating rehydration co-solute from an initial concentration to a final concentration according to a desired profile.

15. (Amended) The method **[for preserving a cell or tissue specimen as claimed in]** of claim 12, wherein the non-permeating rehydration co-solute is selected from the group consisting of an amino acid, [and] an amino acid derivative **[derivatives thereof]**, a betaine, a carbohydrate